CLAIMS

We Claim:

1. A colloidal cupric compound of the formula (I):

$$CuAxBy \qquad (I)$$

where A and B are anions,

$0 \leq x \leq 2$, and

$0 \leq y \leq 2$.

The relationship between x and y is further clarified by Equation II:

$$mx + ny = 2 \qquad (II)$$

where m and n are coefficients equal to oxidation numbers of the anion A and B, respectively,

the anion A representing Cl^-, Br^-, I^-, F^-, NO_3^- SO_4^{2-}, PO_4^{3-}, $RCOO^-$ where R is H, a C_1-C_{20} straight chain or branched hydrocarbon, or an aromatic group, $tartrate^{2-}$, $citrate^{3-}$ or an amino acid residue;

the colloidal cupric compound made by a process comprising:

purifying a Cu^{2+} solution; and

raising the pH of the solution.

2. The colloidal cupric compound of claim 1, wherein the Cu^{2+} solution is prepared from $CuSO_4 \cdot 5H_2O$.

3. The colloidal cupric compound of claim 1, wherein purifying the Cu^{2+} solution is performed by:

adding an oxidizing agent and H_3PO_4 to the solution;

adjusting the pH to 3;

heating the solution; and

removing the solids.

4. The colloidal cupric compound of claim 3, wherein the oxidizing agent is H_2O_2 or bleach.

5. The colloidal cupric compound of claim 3, wherein adjusting the pH to 3 is performed by adding Na_2CO_3 solution.

6. The colloidal cupric compound of claim 1, wherein the process further comprises:

adding the solution to an organic solvent to form a precipitate; and

collecting the precipitate.

7. The colloidal cupric compound of claim 6, wherein the organic solvent is methanol or acetone.

8. The colloidal cupric compound of claim 6, wherein the precipitate is dried by nitrogen flow.

9. A process for producing a colloidal cupric compound of the formula (I):

$$CuAxBy \qquad (I)$$

where A and B are anions,

$0 \leq x \leq 2$, and

$0 \leq y \leq 2$.

The relationship between x and y is further clarified by Equation II:

$$mx + ny = 2 \qquad (II)$$

where m and n are coefficients equal to oxidation numbers of the anion A and B, respectively,

the anion A representing Cl^-, Br^-, I^-, F^-, NO_3^- SO_4^{2-}, PO_4^{3-}, $RCOO^-$ where R is H, a C_1-C_{20} straight chain or branched hydrocarbon, or an aromatic group, $tartrate^{2-}$, $citrate^{3-}$ or an amino acid residue;

the process comprising:

purifying a Cu^{2+} solution; and

raising the pH of the solution.

10. The process claim 9, wherein the Cu^{2+} solution is prepared from $CuSO_4 \cdot 5H_2O$.

11. The process of claim 9, wherein purifying the Cu^{2+} solution is performed by:

adding an oxidizing agent and H_3PO_4 to the solution;

adjusting the pH to 3;

heating the solution; and

removing the solids.

12. The process of claim 11, wherein the oxidizing agent is H_2O_2 or bleach.

13. The process of claim 11, wherein adjusting the pH to 3 is performed by adding Na_2CO_3 solution.

14. The process claim 9, wherein the process further comprises:

adding the solution to an organic solvent to form a precipitate; and

collecting the precipitate.

15. The process of claim 14, wherein the organic solvent is methanol or acetone.

16. The process of claim 14, further comprising drying the precipitate by nitrogen flow.

17. A method of controlling fungal diseases in plants comprising the step of applying to said plants a fungicide comprising the colloidal cupric compound of claim 1.

18. A method of controlling fungal diseases in plants comprising the step of applying to said plants a fungicide made according to the process of claim 9.

19. The method of claim 17, wherein the fungicide is colloidal copper citrate.

20. The method of claim 18, wherein the fungicide is colloidal copper citrate.

21. The method of claim 17, wherein the fungicide is colloidal copper citrate solution containing about 50 mg/L copper.

22. The method of claim 18, wherein the fungicide is colloidal copper citrate solution containing about 50 mg/L copper.